SCA SLAG CEMENT ASSOCIATION

Information Sheets

5: Producing and Placing Slag Cement Concrete

Storage and Handling Slag Cement

Slag cement, like portland cement or portland limestone cement, must be stored in bins or silos to provide protection from moisture and contamination. Since both slag cement and portland/portland limestone cement are delivered in the same type of container truck, care should be taken to distinguish one material from the other in storage and handling. One quick method of distinguishing between slag cement and portland/portland limestone cement is to compare their color. Slag cement is commonly lighter than portland/portland limestone cement. All handling equipment suitable for use with portland/portland limestone cement is also suitable for use with slag cement.

Figure 1: Concrete with slag cement is produced in a similar manner to concrete without slag cement.

Batching

Batching and mixing concrete containing slag cement is similar to ordinary portland/portland limestone cement concrete. ACI 233 recommends that slag cement be batched following portland/portland limestone cement in the same weighing apparatus. The mixing time and mixing equipment are the same.

Transporting

Like all other concrete, slag cement concrete can be transported by a variety of methods and equipment, most commonly, revolving-drum mixers.

Placing

In some types of construction, concrete is placed in forms and then consolidated. Consolidation densifies fresh concrete within forms, and around embedded items and reinforcement; it also eliminates stone pockets, honeycombs, and entrapped air. Slag cement enhances the consolidation and pumping of concrete by improving its rheology. Although the slag cement typically improves the placement characteristics of concrete, proper placing and finishing practices must be followed.

Finishing

Finishing refers to leveling, smoothing, consolidating, and otherwise treating surfaces of fresh, plastic concrete to produce a desired surface or appearance. The finishing operation should be carefully planned. Skill, knowledge, and experience are needed to properly finish concrete. The finisher must have the proper tools and equipment and adequate manpower.

Proper timing of the operations for the existing conditions is critical. In warmer weather, the slower setting characteristics of slag cement concrete can be a benefit to the finisher by allowing sufficient time to complete each step in the finishing process. In cooler weather, finishing operations may need to be delayed due to the slower setting characteristics. Set times can be modified by the addition of chemical admixtures.

Figure 2: Finishing is usually enhanced with slag cement.

Most concrete made with slag cement will have less bleed water than concrete made with portland/portland limestone cement alone. Bleeding rates are also usually slower. Virtually all slag cement used in the United States is ground finer than Type I or Type II cements. Coarser slag cements could have equal or greater bleeding.

Curing

As with all concrete, proper curing practices are essential to achieve the desired properties of concrete. All curing practices used with portland cement concrete are generally compatible when slag cement is used, such as wet curing with fog sprays or burlap, or concrete curing compound.

Figure 3: As with all concrete, proper curing practices are essential.

Reference

1. ACI 233-17, "Guide to the Use of Slag Cement in Concrete and Mortar," American Concrete Institute, Farmington Hills, MI, 2017.